BORON STATISTICS

By David A. Buckingham and Phyllis A. Lyday

[All values are in metric tons (t) boron oxide unless otherwise noted]

Last modification: November 5, 2004

Year	Reported production	Reported imports	Reported exports	Estimated apparent consumption	Estimated unit value ($/t)	Estimated unit value (98$/t)	Reported world production (gross weight)
1900	9,250	178		9,430	111	2,200	46,900
1901	8,420	297		8,720	122	2,400	42,900
1902	7,590	362		7,950	325	6,100	41,300
1903	12,300	219		12,500	57	1,000	54,700
1904	16,300	225		16,500	45	820	65,200
1905	16,500	205		16,700	63	1,100	65,800
1906	20,700	395		21,100	59	1,100	87,400
1907	18,800	514		19,300	63	1,100	95,300
1908	8,910	204		9,110	110	2,000	74,800
1909	14,800	73.3		14,900	104	1,900	86,800
1910	15,100	87.2		15,200	80	1,400	67,100
1911	19,000	125		19,100	83	1,500	99,000
1912	15,100	64.3		15,200	75	1,300	86,000
1913	20,700	110		20,800	73	1,200	55,100
1914	34,600	110		34,700	43	700	
1915	36,300	114		36,400	47	750	
1916	49,900	90.8		50,000	49	730	
1917	52,000	87.2		52,100	70	890	
1918	44,000	66.2		44,100	52	560	
1919	36,800	70.8		36,900	38	360	
1920	60,200	0.634	2,740	56,600	17	140	
1921	18,900	47.0		17,900	85	770	
1922	33,000	0.161		30,600	82	800	
1923	54,000	0.195		49,100	74	710	
1924	47,300			41,800	67	640	
1925	47,200			41,000	65	610	
1926	47,900			41,800	65	600	
1927	41,500			41,500	84	780	
1928	52,300	2,120	26,000	28,400	25	230	
1929	68,200	2,110	30,600	39,700	44	420	
1930	71,300	2.76	31,700	39,600	58	570	
1931	68,400	236	33,300	35,300	45	480	
1932	69,600	0.101	34,300	35,300	10	120	
1933	72,000	0.176	33,600	38,400	24	310	
1934	92,800	0.055	39,700	53,100	36	440	
1935	105,000	0.124	53,000	52,000	41	490	
1936	120,000	0.312	47,200	72,800	42	490	
1937	137,000	0.120	71,300	65,700	38	430	
1938	82,600	0.104	35,900	46,700	45	520	
1939	74,200	0.128	34,900	39,300	63	730	
1940	73,400	0.125	24,600	48,800	65	760	
1941	86,400	0.335	16,000	70,400	70	770	
1942	70,400		14,000	56,400	74	740	
1943	79,500	0.0869	10,400	69,100	73	690	
1944	83,200		12,500	70,700	71	650	
1945	94,900	0.223	16,600	78,300	71	650	
1946	118,000	16.6	20,400	97,600	71	590	
1947	132,000	0.312	32,800	99,200	73	530	
1948	122,000	0.506	27,200	94,900	75	500	
1949	126,000	0.147	41,900	84,100	55	380	

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1950	173,000	0.203	54,600	118,000	63	430	
1951	219,000	0.236	81,700	137,000	49	310	
1952	153,000	0.142	39,500	114,000	65	400	
1953	194,000	0.103	53,300	141,000	62	380	
1954	209,000		78,700	130,000	106	642	
1955	223,000	3.65	85,200	138,000	110	670	
1956	243,000	10.0	93,300	150,000	110	660	
1957	244,000	2,320	82,100	164,000	110	640	
1958	241,000	7.840	90,200	151,000	120	680	
1959	285,000		97,100	188,000	131	732	
1960	294,000		115,000	179,000	131	720	
1961	284,000		103,000	181,000	131	716	
1962	308,000		112,000	196,000	131	708	
1963	335,000		130,000	205,000	131	697	
1964	386,000	16.0	147,000	239,000	131	689	172,000
1965	386,000	2,280	81,500	307,000	131	679	189,000
1966	419,000	4,350	97,300	326,000	141	709	209,000
1967	429,000	9,820	87,400	351,000	144	702	221,000
1968	471,000	6,880	97,500	380,000	154	723	232,000
1969	500,000	8,820	110,000	399,000	154	684	251,000
1970	510,000	9,920	110,000	410,000	174	731	257,000
1971	515,000	2,670	95,400	422,000	173	696	284,000
1972	551,000	7,340	89,100	469,000	173	675	314,000
1973	602,000	6,620	99,300	509,000	184	675	342,000
1974	562,000	7,940	117,000	453,000	226	747	328,000
1975	547,000	10,100	115,000	442,000	242	733	354,000
1976	572,000	11,000	116,000	467,000	254	728	2,340,000
1977	667,000	25,800	141,000	552,000	272	732	2,730,000
1978	706,000	46,100	164,000	588,000	295	738	2,660,000
1979	725,000	36,200	175,000	586,000	385	864	2,520,000
1980	710,000	32,300	173,000	476,000	390	770	2,610,000
1981	671,000	15,100	152,000	534,000	429	770	2,560,000
1982	551,000	8,030	123,000	436,000	464	780	2,270,000
1983	578,000	13,800	124,000	468,000	464	760	2,240,000
1984	667,000	28,300	289,000	344,000	480	750	2,510,000
1985	577,000	28,500	314,000	292,000	494	750	2,510,000
1986	571,000	24,300	310,000	285,000	507	750	2,510,000
1987	625,000	24,400	316,000	333,000	521	748	2,690,000
1988	578,000	23,700	310,000	570,000	521	718	2,990,000
1989	562,000	21,100	353,000	230,000	569	748	2,990,000
1990	608,000	21,400	320,000	309,000	569	710	2,910,000
1991	626,000	20,000	309,000	337,000	517	619	2,960,000
1992	554,000	38,300	294,000	298,000	523	608	2,670,000
1993	574,000	120,000	287,000	407,000	636	717	2,640,000
1994	550,000	73,100	303,000	320,000	678	746	3,810,000
1995	728,000	91,500	342,000	478,000	678	725	4,020,000
1996	581,000	90,100	218,000	453,000	785	815	4,330,000
1997	604,000	115,000	293,000	426,000	711	722	4,580,000
1998	587,000	105,000	291,000	401,000	711	711	4,570,000
1999	618,000	108,000	249,000	477,000	787	770	4,460,000

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2000	546,000	83,600	278,000	352,000	787	745	4,600,000
2001	536,000	89,500	161,000	465,000	787	724	4,740,000
2002	518,000	90,400	124,000	484,000	787	713	4,610,000

Boron Worksheet Notes

Data Sources
Sources for the boron worksheet are the mineral statistics publications of the U.S. Bureau of Mines and the U.S. Geological Survey—Minerals Yearbooks (MYB) and its predecessor, Mineral Resources of the United States (MR); Mineral Commodity Summaries (MCS) and its predecessor, Commodity Data Summaries (CDS); and Mineral Facts and Problems (MFP) publications. Years of publication and corresponding years of data coverage are listed in the References section below. Zeros are used where data are reported as a "small unreported amount." Blank cells in the worksheet indicate that data are not available.

Reported Production
Production data are essentially shipments and include crude ore, and boron minerals and compounds sold or used by producers, including actual mine production and marketable products. Data for the years 1919–24 are reported as "shipped by producers." All data are in terms of boron oxide (B_2O_3) content. If the B_2O_3 content was not reported it was calculated using the theoretical percentage of B_2O_3 in each borate mineral or compound sold or used. Data are reported in the MR and the MYB.

Reported Imports
Data represent contained B_2O_3 in the borate compounds imported into the United States. Most borate compounds are not pure and contain materials such as arsenic and clay. Their B_2O_3 content is calculated using the theoretical percentage of B_2O_3 in each borate compound imported. For the "other borates" category, contained B_2O_3 is calculated using the average (mean) B_2O_3 content of the sodium boron compounds. Data were totaled on an annual basis. Import data are not reported for the years 1924–27, 1942, 1944, and 1959–60. Data are reported in the MR and the MYB.

Reported Exports
Data are contained B_2O_3 in the borate compounds exported from the United States. According to the MYB, most exported borax is either decahydrate or pentahydrate borax. Their average theoretical B_2O_3 content is 42.2%. Current exports show a significant amount of anhydrous borax (69.2% B_2O_3). If the type of exported borate compound, such as anhydrous boric acid, boric acid, or sodium borates is reported, their respective theoretical B_2O_3 content was used to calculate contained B_2O_3. Boron compound export data were not reported prior to 1928, with the exception of the year 1920. Data were totaled on an annual basis. Data are reported in the MR and the MYB.

Estimated Apparent Consumption
Apparent consumption data are in terms of B_2O_3 content. For the years 1900–19, apparent consumption was equal to production plus imports. For the years 1921–27, apparent consumption was interpolated. Apparent consumption was estimated for the years 1920 and 1928–2002 using the following formula:

APPARENT CONSUMPTION = PRODUCTION (sold or used) + IMPORTS – EXPORTS.

Estimated Unit Value ($/t)
Unit value is defined as the estimated value of boron apparent consumption in U.S. dollars of 1 metric ton (t) of 100% B_2O_3 content. Boron production (sold or used) unit value reported in the MR and the MYB are used for the years 1900–54. Borax market price data are reported in the CDS for the years 1955–77 and in MCS are used for the years 1978–2002.

Estimated Unit Value (98$/t)
The Consumer Price Index conversion factor, with 1998 as the base year, is used to adjust unit value in current U.S. dollars to the unit value in constant 1998 U.S. dollars.

Reported World Production
Data are world mine production. World mine production data have been reported in various boron units, with different boron content (elemental boron content, and gross weight boron minerals and compounds). Because of this it was not possible to convert this data to contained B_2O_3. World production data are not reported for the years 1914–64. Data reported in the MR and MYB cover the years 1900–13 and 1976–2002 and are all gross weight data. Data for the years 1964–75 are in terms of elemental boron content and are reported in the 1975 and 1980 MFP.

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